OTTO KATZENSTEIN & CO.
TREE SEEDSMEN

CABLE ADDRESS:
TREESEEDS, ATLANTA, GA.
A. B. C. CODE, 4TH AND 5TH EDITIONS AND PRIVATE CODE

ATLANTA, GA.

Some Practical Suggestions.

HOW TO RAISE TREE SEEDLINGS.

We receive frequent inquiries as to the proper time and best methods of sowing the seeds of evergreens, trees, shrubs, perennials, etc. We have compiled the following general directions in the hope that they may aid the beginner, especially in making the propagation of hardy plants from seed a success.

TESTING OF SEEDS.

People who raise flowers and vegetables from seed with the greatest ease, refrain from the production of tree or shrub seedlings, because they believe that it requires intricate knowledge and the overcoming of many difficulties to arrive at success. This is a mistake. Anybody can be successful in this line, who is observing and who adheres to the laws of nature. It is not advisable for a beginner to go at once into the raising of seedlings on large scale, but success comes with knowledge, experience, and confidence. The few hints here given are the result of practical experience of many years and they should prove serviceable.

We suggest that beginners start with a variety of kinds, find out the ones with which they are most successful and restrict themselves ultimately to the wholesale of those. The market for wellgrown seedlings is practically unlimited, especially if the movement for intensive reforestation and conservation is taken in due consideration.

WHERE TO BUY TREE SEEDS.

The first step should be the purchase of the received seeds from a reliable source. Everything else equal, the price should be considered, but it is fundamentally wrong to waste time and money on "cheap" seed. The ultimate loss of money and time is incomparably larger than the original saving. The seeds should be true to name, fresh, and of at least average germinative quality. A simple, but not absolutely reliable test of quality is to cut a number of seeds open and inspect the kernels for freshness and perfection. Some kinds, such as maples, tulip poplar, and others will unavoidably show a large percentage of empty hulls, but most kinds should show at least 75% of sound kernels. The only dependable test is, however, for germination.

It takes from ten to thirty days for most kinds to germinate. For some species, such as Ilex opaca, Liriodendron, Juniperus, and some other kinds with very hard shells, a longer time is required, even as long as two years in the case of holly, for instance.

Some Practical Suggestions.

HOW TO MAKE TREE SHRUB GROW.

We receive frequent inquiries as to the proper time and best

There are many ways for testing seeds, but the simplest and, at the same time, most reliable method is to fill shallow boxes or pans with soil or sand, sow a stated number of seeds - say one hundred of a kind, cover them with moss or sand about their own depth and keep them moist, until the test is completed. A record should be kept of each inspection, showing how many seeds had germinated any given day. The germinated seeds are removed and, if for instance, ultimately ten seeds are left out of one hundred, this would show a germination of 90% during the testing period.

Winter is the best time to carry on these tests and the test-flats or boxes should be kept in a sunny room with a fairly even temperature of 70 to 80 degrees F. or in a greenhouse.

VITALITY OF TREE & SHRUB SEEDS.

As stated before, the purchaser should insist on the delivery of fresh seed. Some kinds, especially some maples, the elms, birches, willows etc. retain vitality for such a short time only that they should be planted at the earliest possible moment after ripening. Other hardwood tree seeds may show a fair vitality during the second year, but it is decreased Locust, redbud, Gymnocladus, and some other very hard shelled kinds are serviceable for several years. Soft skinned pine seeds, such as Pinus monophylla, palustris, etc. deteriorate considerably after the first year, while the very hard shelled kinds, such as Pinus ponderosa, sabina, and others have been known to give fair results when several years old.

WHERE TO SOW.

(1). Seed Beds:- Larger quantities are sown best in properly prepared seed beds.

Select a location sheltered from heavy East and Northeast winds, and provide for windbreaks in the form of hedges, plantings, fences, etc. where no natural protection is provided. As seed beds can be used indefinitely, careful initial preparation is essential. The best soil is a well drained sandy loam. Where the soil is naturally too heavy, add some sand, and where it is too sandy, add some loam to it. The soil should thoroughly worked to a depth of at least twelve inches, should be free from stones and be brought to as fine a mechanical condition as is possible by repeated raking or harrowing. To enrich the soil, only well rotted manure or compost should be used, but never fresh manure. To avoid much annoyance later on, the seed beds should be free of weeks before the sowings are made, and it is advisable therefore to prepare the beds well in to permit destruction of the weeds. The length of seed beds is unlimited, but their width should not exceed six feet. Beds five feet wide are most convenient to handle.

(2). Sowing in Boxes:- For sowing of small quantities or of rare seeds, the use of shallow boxes about three inches deep and of uniform size is recommended.

Good drainage should be provided by boring holes in the bottom of the boxes, or by leaving cracks between the boards. Fill the boxes with sandy loam not entirely to the top. Level the soil and sow. After sowing,

press the soil down firmly and mulch with a layer of moss or similar material.

The filled boxes may be stowed away during winter in a dry cellar or cold frame- piled to about six high - and when spring comes they can be brought out and the seed cultivated.

By splitting cracker, soap, or canned goods boxes in three, very serviceable seed boxes may be had at lowest cost.

WHEN TO SOW.

While many seeds retain their power to germinate for several years, the most satisfactory results will always be obtained with fresh seeds. The list at the end of this pamphlet will indicate the best time and method for the different seeds.

HOW TO SOW.

Seeds may be sown broadcast or in drills. When sown broadcast a large number of seeds can be sown in a given space but where easier cultivation, quicker weeding, and sturdier plants are an object, the sowing in drills should be given preference.

The depth of sowing depends upon the size of the seeds, but it is better rather to cover insufficiently than to bury seeds too deep. Generally speaking, seeds should not be under ground any deeper than double their diameter at the utmost.

As exception from this rule, conifer seeds should be covered very thinly, only, with soil, while Gleditsias, for instance, will germinate best from a depth of at least two inches.

The distance between the drills is about nine to twelve inches for quick growing decidous plants. For growing evergreens and slow growers, four or five inches will prove sufficient for hand cultivation. For horse cultivation, the rows should be three and one half feet apart, but the land need not be laid off in beds. Drop the seeds fairly evenly and not too thickly and after sowing, press the soil firmly down by light roling or with the back of a spade. A mulch of pine needles, moss, or a light cover of well rotten manure will keep the soil in even moisture and protect the seeds from the direct sun rays. The mulch should be gradually removed as the seedlings appear. A very serviceable screen can be obtained from the use of building laths worked into handy frames and fastened on posts about 18 inches above ground. The posts and screens should be raised as the seedlings attain size until they may be removed entirely. Some growers prefer permanent lath houses about seven feet high.

PREPARATION OF THE SEEDS.

Soaking. Seeds with very hard shells should be soaked immediately before planting to hasten germination. The best plan is to drop them into quite hot water- about 120 degrees- until they show signs of swelling up. They must not be allowed to become dry again. Some seeds will lay even

press the soil down firmly and mulch with a layer of moss or similar mater

The filled boxes may be stowed away during winter in a dry cellar or

for one, two or even three years, even after they have been soaked.

Washing of seeds. Seeds which are covered with thick pulps, such as Magnolias, should have them removed by soaking (macerating) them in wa water. Such cleaned seeds are best either to be sown at once or to be st ified.

Stratification. Some seeds will not germinate the first year i they are allowed to dry out, by leaving them unprotected for any length o time. They should be placed between layers of sand in pots or boxes. The vessels should be kept in sheltered places, where mice cannot reach them a the seeds are to be sown at the usual time in Spring.

Protection of Seeds. To protect seeds against destruction by bi they may be dipped in lead paint before sowing.

SOWING UNDER GLASS.

Very small seeds, such, for instance, as seeds of the heather fa ily, Andromeda azalea, Rhododendron, etc. may be sown under glass. The us of pans filled with finely sifted peat loam is advised. The pans should h thorough drainage and they should be well watered before sowing. The seed should have a very light cover only, and be mulched thinly with pulverized sphagnum moss.

The soil should never become dry, but should be watered with ver fine rose only. The vessels should be kept covered with glass bulbs or pa When the germination begins remove the mulch and prick off as soon as the first leaf is discernable. Transplant the seedlings as often as possible a harden them quickly, so that they may be transplanted to beds in the open ground in the Spring of their second season.

CARE OF SEED BEDS.

If the seed was sown when the beds were in proper condition and when the beds were mulched and shaded, but little watering should be found necessary. If imperative, water early in the morning or late in the after noon and use a fine spray only, to prevent any "damping off".

"Damping off" is a fungous disease generally caused by excessive moisture, especially in hot weather. It may be prevented by thin sowing a frequent cultivation, and it is sometimes cured by sprinkling powdered cha coal or dry sand over the infected bed.

AFTER CARE.

After the seedlings appear, they need close watching. They shou be carefully, but lightly cultivated. The shading should be properly adju ed and necessary watering should be judiciously administered. Seedlings o deciduous plants should be large enough to be transplanted in nursery rows during the next planting season. Seedlings of conifers should be pricked very early after germination and they should be transplanted repeatedly.

HERBACEOUS PLANTS.

Unless sown in large quantities, the use of boxes as described before will be found best. Fall sowings will generally produce best results and flowering plants for the next season. The seedlings should be pricked out in other boxes or planted out at once. Seeds with very hard shells shou be soaked well before sowing, but even then some kinds lay over a whole year

FERNS.

Ferns are best sown under glass in well drained pans filled with coarse peat or on pieces pf peat placed in pans of water. The spores should be sown very thinly and evenly and pressed down. They should not be covered but must be watched closely to overcome any signs of damping off. Keep even shade and moderate temperatures. Prick off in coarse peat as soon as the seedlings appear and transplant as often as needed.

A LIST SHOWING THE BEST TIME AND METHOD OF SOWING.

A. Seeds of short vitality to be sown promptly after ripening.

B. Seeds best sown in fall.

C. Seeds to be sown in Fall or to be stratified.

D. Seeds to be sown in early Spring.

E. Seeds to be sown after ground is well warmed in Spring.

F. Seeds which should be stratified but which may "lay over" a year or longer before germination.

G. Seeds to be soaked in very hot water immediately before sowing.

H. Seeds with thick pulp which should be washed off just before sowing or which should be stratified after being washed.

I. Seeds of hardy plants best sown under glass.

J. Seeds of tender plants to be sown under glass.

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Abies	E	Aralia	E	Camphora	B	Chamaecyparis	E
Acacia	G	Arbutus	E I	Caragana	E G	Chionanthus	D
Acer (11)	A	Arctostaphylos	C	Carpinus	A	Citrus	C
Aesculus	C	Ardisia	J	Carya	D	Clematis	D
Ailantus	B	Aristolochia	E	Castanea	C	Clethra	E
Albizzia	E G	Asimina	E G	Castanopsis	C	Cliftonia	E I
Alnus	C	Azalea	I	Catalpa	D	Colutea	E G
Althaea	E	Berberis	D H	Ceanothus	E	Cornus	B
Amelanchier	F	Betula	A	Celastrus	E	Corylus	C
Amorpha	E	Buxus	E G	Celtis	D	Crataegus	E F
Ampelopsis	E H	Callicarpa	D	Cephalanthhs	E	Cupressus	E
Andromeda	E I	Calycanthus	E	Cercis	E G	Cytisus	E G

Diospyros	D	Ilex	F G	Negundo	B	Sambucus	D
Dirca	E	Itea	E	Nyssa	E	Sassafras	E
Dracaena	E I	Juglans	D	Opuntia	E I	Schinus	E
Elaeagnus	E	Juniperus	F	Ostrya	D	Sequoia	E
Eucalyptus	B E	Kalmia	E I	Oxydendron	E I	Smilax	C
Euonymus	H	Koelreuteria	E	Paulownia	E	Sophora	D
Exochorda	D	Laburnum	E G	Persea	E F	Sorbus	E H
Fagus	D	Lagerstroemia	E	Picea	E	Spartium	E G
Fothergilla	B G	Laurus	E H	Pieris	E I	Spiraea	E
Fraxinus	B	Larix	E	Pinus	E	Staphlaea	D
Fremontia	E	Leucothoe	E I	Platanus	E	Stuartia	E
Gaultheria	C	Libocedrus	E	Populus	A	Symphoricarpus	C
Gingko (2)	E H	Ligustrum	E H	Prunus	C H	Syringa	E
Gleditsia	G	Lindera	E H	Pseudotsuga	E	Taxodium	E B
Gordonia	E	Liquidambar	E	Ptelea	B E	Tecoma	E
Gymnocladus	D G	Liriodendron	E F	Pyrus	E H	Thuya	C
Halesia	E F	Lonicera	E	Quercus (3)	D	Tilia	C
Hamamelis	E F	Maclura	E	Rhamnus	D	Torreya	E
Hedera	H	Magnolia	E F H	Rhododendron	E I	Tsuga	E
Heteromeles	E F	Melia	E	Rhus	D	Ulmus	A
Hibiscus, hardy	E	Menispermum	E	Robinia	E G	Umbellularia	F E
Hibiscus, tender	J	Mohrodendron	F	Romneya	E	Viburnum	E H
Hicoria	D	Morus	E	Rosa	B G H	Vitis	E
Hydrangea	E I	Myrica	E	Rubus	C F	Wistaria	E
						Yucca	E

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(1) Acer dasycarpum and Acer rubrum are more perishable than most other species.

(2) Gingko seed generally are sold washed.

(3) Some species - those belonging to the White Oak family especially- mus be sown immediately after ripening. They do not keep.

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HOW TO MAKE ★★★
TREE SEEDS GROW

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